<110> The Board of Regents of the University of Nebraska

<120> ALCOHOL OXIDASE 1 REGULATORY NUCLEOTIDE SEQUENCES FOR
       HETEROLOGOUS GENE EXPRESSION IN YEAST

<130> UNL 3071.1

<140> 10/116,993

<141> 2002-04-05

<160> 31

<170> PatentIn version 3.1

<210> 1

<211> 1052

<212> DNA

<213> Pichia pastoris

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ttcgagatct aacatccaaa gacgaaaggt tgaatgaaac cttttttgcca tccgacatcc   180

acaggtccat tctcacacat aagtgccaaa cgcaacagga ggggatacac tagcagcaga   240

ccgttgcaaa cgcaggactc atcctcttct ctaacaccat tttgcatgaa aacagccagt   300

tatgggcttg atggagctcg ctcattccaa ttccttctat taggctacta acaccatgac   360

tttattagcc tgtctatcct ggcccccctg gcgaggtcat gtttgtttat ttccgaatgc   420

aacaagctcc gcattacacc cgaacatcac tccagatgag ggctttctga gtgtggggtc   480

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tgaacccggt ggcacctgtg ccgaaacgca aatggggaaa caacccgctt tttggatgat      780

tatgcattgt cctccacatt gtatgcttcc aagattctgg tgggaatact gctgatagcc      840

taacgttcat gatcaaaatt taactgttct aacccctact tggacaggca atatataaac      900

agaaggaagc tgccctgtct taaacctttt tttttatcat cattattagc ttactttcat      960

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<212>   DNA

<213>   Pichia pastoris


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accaactgga tgtcctaacg aaatggttct gtggtctagt tggttatggc atatgcttaa      180

cacgcaaacg tccccagttc gatcctgggc agaatcatta tttttgacc gaattctttt       240

tttcagacca tatgaccggt ccatcttcta cggggggatt atctatgctt tgacctctat      300

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attgtgatca agaagcagag acaatcacca ctaaggttgc acatttgagc cagtaggctc      480

ctaatagagg ttcgatactt attttgataa tacgacatat tgtcttacct ctgaatgtgt      540

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ccaattgaag gctacgagat accagactat cactagtaga actttgacat ctgctaaagc      660

agatcaaata tccatttatc cagaatcaat taccttcctt tagcttgtcg aaggcatgaa      720

aaagctacat gaaaatcccc atccttgaag ttttgtcagc ttaaaggact ccatttccta      780

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2

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cgagtcatca tcaccaccca acgatggtga aaaactttaa gcatagattg atggagggtg     1020

tatggcactt ggcggctgca ttagagtttg aaactatggg gtaatacatc acatccggaa     1080

ctgatccgac tccgagatca tatgcaaagc acgtgatgta ccccgtaaac tgctcggatt     1140

atcgttgcaa ttcatcgtct taaacagtac aagaaacttt attcatgggt cattggactc     1200

tgatgagggg cacatttccc caatgatttt ttgggaaaga aagccgtaag aggacagtta     1260

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ccttcaccgg ttgagatggg gagaaaatta agcgatgagg agacgattat tggtataaaa     1560

gaagcaacca aaatccctta ttgtcctttt ctgatcagca tcaaagaata ttgtcttaaa     1620

acgggctttt aactacattg ttcttacaca ttgcaaacct cttccttcta tttcggatca     1680

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<213> Pichia pastoris

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agtaagtgag atccaacacc caggaacgag atggattcag gagaaattgt tctgccatcc      180

gacatcgaca agttagacac aatagtgcca aatgcagagg ggacgtttcc tcaaggcaag      240

aactccactt tattcctcct caaacacccg ccttcgccgt aaaaaccag cccagttact      300

aaacatggtt tggactctct ctaatccact ttgttaggct actagtagca ttattttctt      360

agcctgtcta tatggttcct tgcgagtttt taattttatt tctatttccg aatgtaactt      420

actccgcatt ccatcccaac accagaaagt tgagggtttt tgtgagtgtg gggtcggtaa      480
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3

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cagtttcatg ttcccccaat ggcctaaaat tgacacttta gacgccctgt tcaaactcaa     540

attgacaaaa gcgtgatctc atcagagatg aactaggttt ggttcgatca aaagctaacg     600

gccagttggt caaaaagaaa cttccaatgt cggcataccg tttgtttcgt ttgacccgac     660

aattgatgtt gaagaattcc ctcttacact tagcgcagcc tttattttgc ttggggtctc     720

gctgcgcttg ggtctcggtg tgcttgtgac cggaaacgca aatggggaaa cacccgcttt     780

ttggatgatt atgcattgtt ctccacattg tatgcttcca agtttctggt gggaatactg     840

atagcctaac gttcatgatc aaaactaatg tcttccctac ttgaacagca atatataaac     900

agaagaagat ttcctttcta aggtcttttt ttttatcatc attatcagct tactttcata     960

attgtgactg gttccaattg acaagctttt gattctaacg actttaacga caacctaaag    1020

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<211> 21

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<213> Yeast

<220>

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<220>

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<222> (5)..(5)

<223> n=unknown

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<222> (6)..(6)

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<222> (16)..(16)

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<223> n=unknown

<220>

<221> misc_feature

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<223> n=unknown

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<210> 5

<211> 10

<212> DNA

<213> Yeast

<220>

<221> misc_feature

<222> (3)..(3)

<223> n=unknown

<400> 5
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<211> 16

<212> DNA

<213> Yeast

<400> 6
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<210> 7

<211> 16

<212> DNA

<213> methylotrophic yeast

<400> 7
ctgtcttgga acctaa   16

<210> 8

<211> 16

<212> DNA

<213> methylotrophic yeast

<400> 8
gaaacttcca aaagtc   16

<210> 9

<211> 16

<212> DNA

<213> methylotrophic yeast

<400> 9
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<210> 10

<211> 16

<212> DNA

<213> methylotrophic yeast

<400> 10
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<210> 11

<211> 15

<212> DNA

<213> methylotrophic yeast

<400> 11
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<210> 12

<211> 15

<212> DNA

<213> methylotrophic yeast

<400> 12
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<210> 13

<211> 15

<212> DNA

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<400> 13
ctgctgatag cctaa   15

<210> 14

<211> 15

<212> DNA

<213> methylotrophic yeast

<400> 14
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<210> 15

<211> 15

<212> DNA

<213> methylotrophic yeast

<400> 15
gagtgtgggg tcaaa   15

<210> 16

<211> 256

<212> DNA

<213> Pichia pastoris

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actcatgttg gtattgtgaa atagacgcag atcgggaaca ctgaaaaata acagttatta   120

ttcgagatct aacatccaaa gacgaaaggt tgaatgaaac cttttttgcca tccgacatcc   180

acaggtccat tctcacacat aagtgccaaa cgcaacagga ggggatacac tagcagcaga   240

ccgttgcaaa cgcagg   256

<210> 17

<211> 140

<212> DNA

<213> Pichia pastoris

<400> 17

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tcctggcccc cctggcgagg                                                    140
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<210> 18
<211> 139
<212> DNA
<213> Pichia pastoris

<400> 18
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<210> 19
<211> 127
<212> DNA
<213> Pichia pastoris

<400> 19
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aacctaatat gacaaaagcg tgatctcatc caagatgaac taagtttggt tcgttgaaat        60

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ggtattg                                                                 127
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<210> 20
<211> 151
<212> DNA
<213> Pichia pastoris

<400> 20
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aacccggtgg cacctgtgcc gaaacgcaaa tggggaaaca acccgctttt tggatgatta       120

tgcattgtcc tccacattgt atgcttccaa g                                      151
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<210>  21

<211>  282

<212>  DNA

<213>  Pichia pastoris


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ccctacttgg acaggcaata tataaacaga aggaagctgc cctgtcttaa accttttttt     120

ttatcatcat tattagctta ctttcataat tgcgactggt tccaattgac aagcttttga     180

ttttaacgac ttttaacgac aacttgagaa gatcaaaaaa caactaatta ttcgaaacga     240

tggctatccc cgaagagttt gatatcctag ttctaggtgg tg                       282


<210>  22

<211>  20

<212>  DNA

<213>  Artificial/Unknown


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<223>  Primer


<400>  22
acgcaggaat tcctccactc                                                  20


<210>  23

<211>  20

<212>  DNA

<213>  Artificial/Unknown


<220>
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<221> misc_feature

<222> (1)..(20)

<223> Primer

<400> 23
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<210> 24

<211> 22

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc_feature

<222> (1)..(22)

<223> Primer

<400> 24
gtcttggaat tcctaaatatg ac   22

<210> 25

<211> 22

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc_feature

<222> (1)..(22)

<223> Primer

<400> 25
ggtattgaat tcacgaatgc tc   22

<210> 26

<211> 20

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc_feature

<222> (1)..(20)

<223> Primer

<400> 26
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<210> 27

<211> 912

<212> DNA

<213> Artificial Sequence

<220>
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ttcgagatct aacatccaaa gacgaaaggt tgaatgaaac cttttttgcca tccgacatcc   180

acaggtccat tctcacacat aagtgccaaa cgcaacagga ggggatacac tagcagcaga   240

ccgttgcaaa cgcaggtcat gtttgtttat ttccgaatgc aacaagctcc gcattacacc   300

cgaacatcac tccagatgag ggctttctga gtgtggggtc aaatagtttc atgttcccaa   360

atggcccaaa actgacagtt taaacgctgt cttggaacct aatatgacaa aagcgtgatc   420

tcatccaaga tgaactaagt ttggttcgtt gaaatcctaa cggccagttg gtcaaaaaga   480

aacttccaaa agtcgccata ccgtttgtct tgtttggtat tgattgacga atgctcaaaa   540

ataatctcat taatgcttag cgcagtctct ctatcgcttc tgaacccggt ggcacctgtg   600

12

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ccgaaacgca aatgggggaaa caacccgctt tttggatgat tatgcattgt cctccacatt    660

gtatgcttcc aagattctgg tgggaatact gctgatagcc taacgttcat gatcaaaatt    720

taactgttct aaccccctact tggacaggca atatataaac agaaggaagc tgccctgtct    780

taaaccttttt tttttatcat cattattagc ttactttcat aattgcgact ggttccaatt    840

gacaagcttt tgattttaac gacttttaac gacaacttga gaagatcaaa aaacaactaa    900

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<210>   28

<211>   913

<212>   DNA

<213>   Artificial Sequence


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<223>   Derived from SEQ ID NO:1 by deleting nt.397-535.


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ttcgagatct aacatccaaa gacgaaaggt tgaatgaaac ctttttgcca tccgacatcc    180

acaggtccat tctcacacat aagtgccaaa cgcaacagga ggggatacac tagcagcaga    240

ccgttgcaaa cgcaggactc atcctcttct ctaacaccat tttgcatgaa aacagccagt    300

tatgggcttg atggagctcg ctcattccaa ttccttctat taggctacta acaccatgac    360

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aaacttccaa aagtcgccat accgtttgtc ttgtttggta ttgattgacg aatgctcaaa    540

aataatctca ttaatgctta gcgcagtctc tctatcgctt ctgaacccgg tggcacctgt    600

gccgaaacgc aaatggggaa acaacccgct ttttggatga ttatgcattg tcctccacat    660

tgtatgcttc caagattctg gtgggaatac tgctgatagc ctaacgttca tgatcaaaat    720

ttaactgttc taaccccctac ttggacaggc aatatataaa cagaaggaag ctgccctgtc    780

ttaaaccttt ttttttatca tcattattag cttactttca taattgcgac tggttccaat    840

tgacaagctt ttgattttaa cgacttttaa cgacaacttg agaagatcaa aaaacaacta    900

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13

<210> 29

<211> 925

<212> DNA

<213> Artificial Sequence

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<400> 29

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actcatgttg gtattgtgaa atagacgcag atcgggaaca ctgaaaaata acagttatta     120

ttcgagatct aacatccaaa gacgaaaggt tgaatgaaac ctttttgcca tccgacatcc     180

acaggtccat tctcacacat aagtgccaaa cgcaacagga ggggatacac tagcagcaga     240

ccgttgcaaa cgcaggactc atcctcttct ctaacaccat tttgcatgaa aacagccagt     300

tatgggcttg atggagctcg ctcattccaa ttccttctat taggctacta acaccatgac     360

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tgtcctccac attgtatgct tccaagattc tggtgggaat actgctgata gcctaacgtt     720

catgatcaaa atttaactgt tctaacccct acttggacag gcaatatata aacagaagga     780

agctgccctg tcttaaacct ttttttttat catcattatt agcttacttt cataattgcg     840

actggttcca attgacaagc ttttgatttt aacgactttt aacgacaact tgagaagatc     900

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<211> 901

<212> DNA

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14

<400> 30

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actcatgttg gtattgtgaa atagacgcag atcgggaaca ctgaaaaata acagttatta     120

ttcgagatct aacatccaaa gacgaaaggt tgaatgaaac ctttttgcca tccgacatcc     180

acaggtccat tctcacacat aagtgccaaa cgcaacagga ggggatacac tagcagcaga     240

ccgttgcaaa cgcaggactc atcctcttct ctaacaccat tttgcatgaa aacagccagt     300

tatgggcttg atggagctcg ctcattccaa ttccttctat taggctacta acaccatgac     360

tttattagcc tgtctatcct ggcccccctg gcgaggtcat gtttgtttat ttccgaatgc     420

aacaagctcc gcattacacc cgaacatcac tccagatgag ggctttctga gtgtggggtc     480

aaatagtttc atgttcccaa atggcccaaa actgacagtt taaacgctgt cttggaacct     540

aatatgacaa aagcgtgatc tcatccaaga tgaactaagt ttggttcgtt gaaatcctaa     600

cggccagttg gtcaaaaaga aacttccaaa agtcgccata ccgtttgtct tgtttggtat     660

tgattctggt gggaatactg ctgatagcct aacgttcatg atcaaaattt aactgttcta     720

acccctactt ggacaggcaa tatataaaca gaaggaagct gccctgtctt aaaccttttt     780

ttttatcatc attattagct tactttcata attgcgactg gttccaattg acaagctttt     840

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<400> 31

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gagctcgctc attccaattc cttctattag ctactaaca ccatgacttt attagcctgt     120
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ctatcctggc ccccctggcg aggtcatgtt tgtttatttc cgaatgcaac aagctccgca      180

ttacacccga acatcactcc agatgagggc tttctgagtg tggggtcaaa tagtttcatg      240

ttcccaaatg gcccaaaact gacagtttaa acgctgtctt ggaacctaat atgacaaaag      300

cgtgatctca tccaagatga actaagtttg gttcgttgaa atcctaacgg ccagttggtc      360

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caaaatttaa ctgttctaac ccctacttgg acaggcaata tataaacaga aggaagctgc      660

cctgtcttaa accttttttt ttatcatcat tattagctta ctttcataat tgcgactggt      720

tccaattgac aagcttttga ttttaacgac ttttaacgac aacttgagaa gatcaaaaaa      780

caactaatta ttcgaaacg                                                   799
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